WHAT IS CLAIMED IS:

1. A computerized method for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the method comprising:

   adjusting the position of a control point in an intermediary row in the U direction to provide a smooth transition from the row of control points corresponding to a first edge along the U direction to a row of control points corresponding to a second edge along the U direction;

   adjusting the position of the control point in an intermediary row in the V direction to provide a smooth transition from the row of control points corresponding to a first edge along the V direction to a row of control points corresponding to a second edge along the V direction; and

   computing the new position of the control point based on the corresponding adjusted positions of the control point in the intermediary row in the U direction and the control points in the intermediary row in the V direction.

2. The method of claim 1 wherein the plurality of control points define a surface.

3. The method of claim 2 wherein the surface comprises a surface selected from the group consisting of a Béziers surface and a Nurbs surface, wherein the surface is represented in a CAD system.

4. The method of claim 2 wherein the surface comprises a three-dimensional surface.

5. The method of claim 1 wherein computing the new position additionally comprises averaging the adjusted position of the control point in the intermediary row in the U direction and the adjusted position of the control point in the intermediary row in the V direction.

6. The method of claim 1 further comprising:

determining a reference axis for the first edge along the U direction, the second edge along the U direction, the first edge along the V direction, and the second edge along the V direction, wherein the method of determining the reference axis comprises:

for each edge:

determining an X vector comprising a first vector point located at a first extremity of the edge and a second vector point located at a second extremity of the edge;

determining a Z vector comprising the average of two extreme vectors orthogonally adjusted to the X vector, wherein the two extreme vectors comprise a vector formed by an extremity point and its neighbor; and

determining a Y vector comprising the vectorial product of the X vector and the Z vector.

7. The method of claim 6 wherein adjusting the position of a control point in an intermediary row in the U direction comprises adjusting the control point using the reference axis for the first edge along the U direction and the second edge along the U direction; and wherein adjusting the position of a control point in an intermediary row in the V direction further adjusting the control point using the reference axis for the first edge along the V direction and the second edge along the V direction.

8. The method of claim 1 further comprising:

identifying a first row in the U direction corresponding to the control point;

determining if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determining if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

adjusting the control point using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

9. The method of claim 8 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and

wherein adjusting the control point using the first U plane and the second U plane comprises projecting the control point on the adjusted U plane.

10. The method of claim 8 further comprising:

identifying a second row in the V direction corresponding to the control point;

determining if a row of control points corresponding to a first edge along the V direction and the second row belongs in a first V plane;

determining if a row of control points corresponding to a second edge along the V direction and the second row belongs in a second V plane; and

adjusting the control point using the first V plane and the second V plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the V direction belongs in the first V plane and the row of control points corresponding to the second edge along the V direction belongs in the second V plane.

11. The method of claim 10 further comprising:

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane;

wherein adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted V plane.

12. The method of claim 10 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane.

13. The method of 12 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane

comprises projecting the control point on an intersection of the adjusted U plane and the adjusted V plane.

14. The method of 12 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted U plane.

15. The method of 12 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted V plane.

16. The method of claim 1 further comprising repeating the first adjusting step, second adjusting step, and computing step for each point that is not along the first edge in the U direction, second edge in the U direction, third edge in the V direction, and fourth edge in the V direction.

17. A computerized method for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the method comprising:

identifying a first row in the U direction corresponding to a control point;

determining if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determining if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

adjusting the control point using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

18. The method of claim 17 wherein the plurality of control points define a surface.

19. The method of claim 17 wherein the surface comprises a surface selected from the group consisting of a Béziers surface and a Nurbs surface, wherein the surface is represented in a CAD system.

20. The method of claim 17 wherein the surface comprises a three-dimensional surface.

21. The method of claim 18 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane;

wherein adjusting the control point using the first U plane and the second U plane comprises projecting the control point on the adjusted U plane.

22. The method of claim 18 further comprising:

identifying a second row in the V direction corresponding to the control point;

determining if a row of control points corresponding to a first edge along the V direction and the second row belongs in a first V plane;

determining if a row of control points corresponding to a second edge along the V direction and the second row belongs in a second V plane; and

adjusting the control point using the first V plane and the second V plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the V direction belongs in the first V plane and the row of control points corresponding to the second edge along the V direction belongs in the second V plane.

23. The method of claim 22 further comprising:

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane;

wherein adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted V plane.

24. The method of claim 22 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane.

25. The method of 24 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on an intersection of the adjusted U plane and the adjusted V plane.

26. The method of 24 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted U plane.

27. The method of 24 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted V plane.

28. A computerized method for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the method comprising:

identifying a first row in the U direction corresponding to a control point;

determining if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determining if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

constraining the control point using the first U plane and the second U plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

29. The method of claim 28 wherein the network of control points defines a surface.

30. The method of claim 29 wherein the surface comprises a surface selected from the group consisting of a Béziers surface and a Nurbs surface, wherein the surface is represented in a CAD system.

31. The method of claim 28 wherein the surface comprises a three-dimensional surface.

32. The method of claim 28 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane;

wherein constraining the control point using the first U plane and the second U plane comprises constraining the control point on the adjusted U plane.

33. The method of claim 28 further comprising:

identifying a second row in the V direction corresponding to the control point;

determining if a row of control points corresponding to a first edge along the V direction and the second row belongs in a first V plane;

determining if a row of control points corresponding to a second edge along the V direction and the second row belongs in a second V plane; and

constraining the control point using the first V plane and the second V plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along

the V direction belongs in the first V plane and the row of control points corresponding to the second edge along the V direction belongs in the second V plane.

34. The method of claim 33 further comprising:

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane;

wherein adjusting the control point using the first V plane and the second V plane comprises constraining the control point on the adjusted V plane.

35. The method of claim 33 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane.

36. The method of 35 wherein constraining the control point using the first U plane and the second U plane and constraining the control point using the first V plane and the second V plane comprises constraining the control point to an intersection of the adjusted U plane and the adjusted V plane.

37. The method of 35 wherein constraining the control point using the first U plane and the second U plane and constraining the control point using the first V plane and the second V plane comprises constraining the control point to the adjusted U plane.

38. The method of 35 wherein constraining the control point using the first U plane and the second U plane and constraining the control point using the first V plane and the second V plane comprises constraining the control point to the adjusted V plane.

39. A computer system for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the system comprising:

a computer, wherein the computer comprises a memory and a processor; and

executable software residing in the computer memory wherein the software is operative with the processor to:

adjust the position of a control point in an intermediary row in the U direction to provide a smooth transition from the row of control points corresponding to a first edge along the U direction to a row of control points corresponding to a second edge along the U direction;

adjust the position of the control point in an intermediary row in the V direction to provide a smooth transition from the row of control points corresponding to a first edge along the V direction to a row of control points corresponding to a second edge along the V direction; and

compute the new position of the control point based on the corresponding adjusted positions of the control point in the intermediary row in the U direction and the control points in the intermediary row in the V direction.

40. A computer data signal embodied in a digital data stream for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the signal comprising the steps of:

adjusting the position of a control point in an intermediary row in the U direction to provide a smooth transition from the row of control points corresponding to a first edge along the U direction to a row of control points corresponding to a second edge along the U direction;

adjusting the position of the control point in an intermediary row in the V direction to provide a smooth transition from the row of control points corresponding to a first edge along the V direction to a row of control points corresponding to a second edge along the V direction; and

computing the new position of the control point based on the corresponding adjusted positions of the control point in the intermediary row in the U direction and the control points in the intermediary row in the V direction.

41. A computer system for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the system comprising:

a computer, wherein the computer comprises a memory and a processor; and

executable software residing in the computer memory wherein the software is operative with the processor to:

identify a first row in the U direction corresponding to a control point;

determine if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determine if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

adjust the control point using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

42. A computer data signal embodied in a digital data stream for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the signal comprising the steps of:

identifying a first row in the U direction corresponding to a control point;

determining if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determining if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

adjusting the control point using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

43. A computer system for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the system comprising:

a computer, wherein the computer comprises a memory and a processor; and

executable software residing in the computer memory wherein the software is operative with the processor to:

identify a first row in the U direction corresponding to a control point;

determine if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determine if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

constrain the control point using the first U plane and the second U plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

44. A computer data signal embodied in a digital data stream for manipulating a plurality of control points, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the signal comprising the steps of:

identifying a first row in the U direction corresponding to a control point;

determining if a row of control points corresponding to a first edge along the U direction and the first row belongs in a first U plane;

determining if a row of control points corresponding to a second edge along the U direction and the first row belongs in a second U plane; and

constraining the control point using the first U plane and the second U plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.